

INSTRUCTIONAL MEMORANDUM

IOWA DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION OFFICE OF MAINTENANCE

CHAPTER: DRAINAGE MAINTENANCE	NO: 4.112
TITLE: MARKINGS AT DRAINAGE STRUCTURES	
APPROVED: Lee Wilkinson	ORIGINATION DATE: January 6, 1984
	REVISION DATE: July 1, 2003

I. Purpose:

To provide guidance to field personnel on the placement of markers to identify drainage structures which may be considered obstructions and to locate outlets for inspection and maintenance purposes.

II. References:

- A. Current Manual on Uniform Traffic Control Devices (MUTCD)
- B. Standard Road Plans, RE 48A and 48B

III. General Guidelines:

- A. Pages 4 thru 10 illustrate the various type markings and recommended placement.
- B. Where object markers are required, the inside edge of the object marker should be in line with the inner edge of the obstruction.
- C. Where culverts or flumes are currently marked with a wood guard post, they should be removed and the appropriate steel post installed.
- D. No markers are to be placed on culvert ends or subdrain outlets located in the median of divided highways.

IV. Procedures:

- A. Culverts
 - 1. Culvert headwalls which are protected by guardrail do not require any markings. Delineation placed in conjunction with the guardrail should be maintained. The culvert opening may be marked with an orange post.
 - 2. Culvert headwalls located within the shoulder shall be marked with a type 3 object marker. A marker shall be placed at each side of the headwall, visible to traffic in both directions. At culverts with a span of 6 foot or less it is permissible (but not required) to mount the object markers back to back on a single post (Refer of Figure 1). If pipe culvert aprons or ends are located in the shoulder, they shall be marked in a similar manner.

3. Culvert headwalls located beyond the edge of shoulder, but less than 3 feet from the edge of shoulder, shall be marked with a type 2 object marker. One marker shall be placed at the leading edge of the headwall visible to approaching traffic in the adjacent lane. If the headwall is located on the outside of a super elevated curve, an additional type 2 object marker shall be placed on the far side of the headwall, visible to traffic in the opposite direction (Refer to Figure 2). If 36 inch or larger pipe aprons or ends are located within 3 feet of the shoulder, they should be marked in a similar manner. Pipes less than 36 inches in diameter do not require markers.
 4. Culvert headwalls, pipe apron, or ends located 3 or more feet from the edge of shoulder shall be marked with an orange post. No object marker or delineators shall be placed on these posts.
- B. Subdrain Outlets
1. Outlet to longitudinal subdrains shall be marked with an orange post. Outlets installed in conjunction with full depth patches shall not be marked. No delineators shall be place on this post.
- C. Ditch Intakes
1. Ditch intakes shall be identified with a black and white sign mounted on a delineator post.
 2. Signs are available from the Sign Shop.
 3. Posts shall be placed adjacent to the intake on the far side away from the roadway (Refer to Figure 3).
 4. Intake markings which do not comply with these procedures may remain as they presently exist until such time as the existing markings require replacement or maintenance.
- D. Flumes
1. Flumes adjacent to the pavement having lip type curb shall be marked with a type 2 object marker.
 2. The object marker shall be in front of the flume and 5 1/2 feet from the edge of the pavement.
- E. Bridges
1. On full shoulder width bridges a type 3 object marker shall be placed at each corner of two-way bridges and at the two approach corners on one-way bridges regardless of whether approach guardrail is present (Refer to Figure 4).
 2. On bridges less than full shoulder width and where no approach guardrail is present, three type 3 object markers shall be placed on each corner of two-way bridges and the two approach corners of one-way bridges (Refer to Figure 5).

3. On bridges less than full shoulder width, where approach guardrail is present and attached to the bridge end post, a type 3 object marker shall be placed at each corner of two-way bridges and the two approach corners of one-way bridges. In addition, type 2 object markers shall be placed at approximately 25-foot intervals behind the guardrail with the first marker being located at the approach end of the guardrail. In lieu of a type 2 object maker, the first marker may be an in-rail delineator (Refer to Figure 6).
4. On bridges less than full shoulder width where approach guardrail is present but not attached to the bridge end post, a type 3 object marker shall be placed at each corner of two-way bridges and the two approach corners of one-way bridges. In addition, a type 3 object marker shall be placed at the approach end of the guardrail and one additional marker halfway between the bridge and approach end of the rail (Refer to Figure 7).

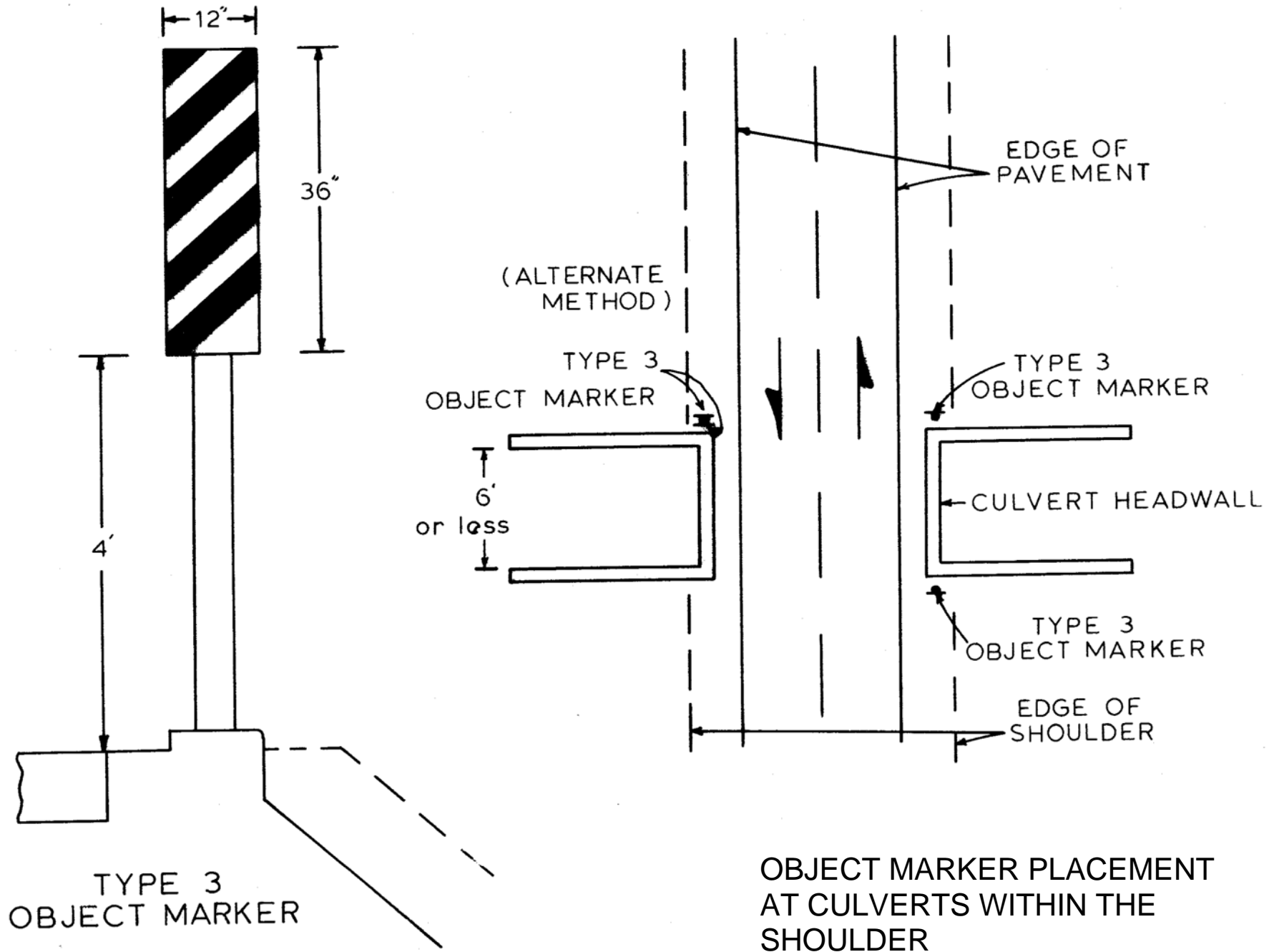
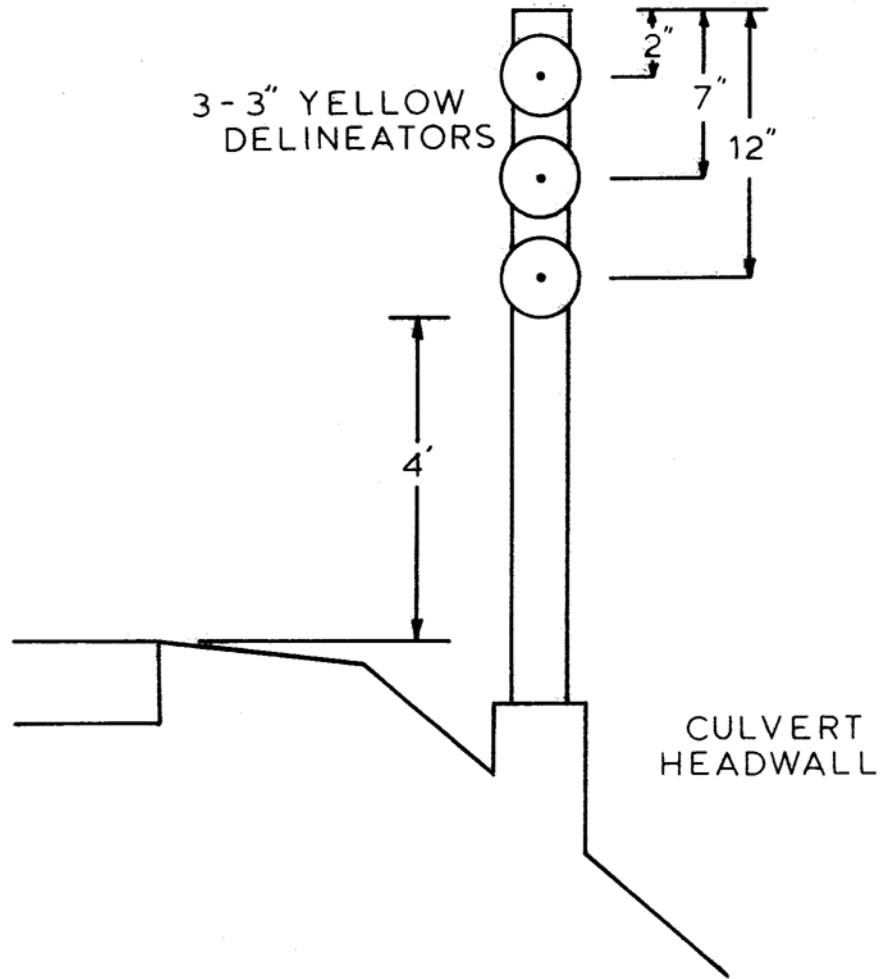
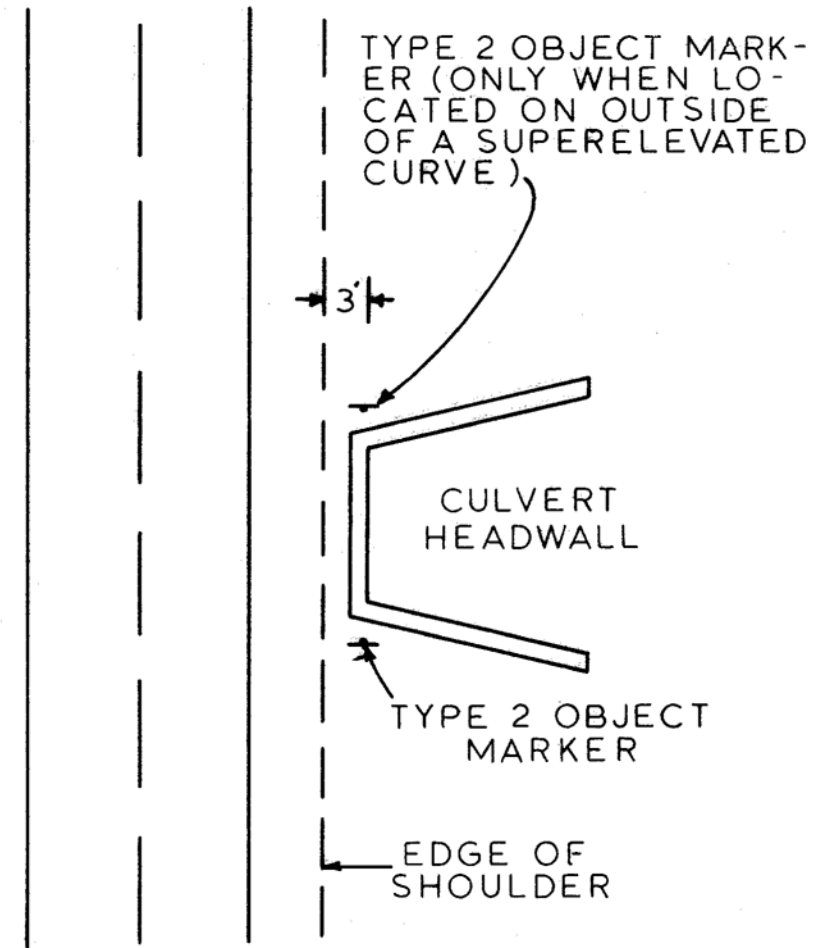


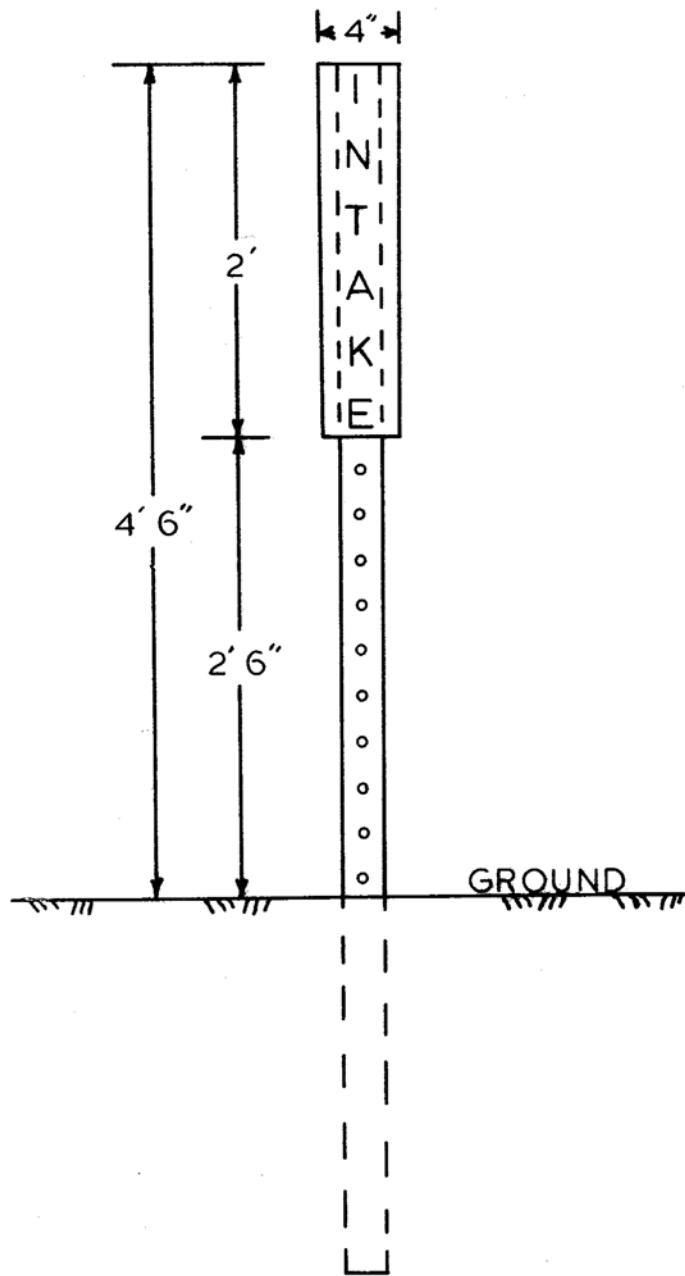
FIGURE 1
4 of 10



TYPE 2
OBJECT MARKER



OBJECT MARKER PLACEMENT
AT CULVERTS WITHIN 3 FEET
OF THE EDGE OF SHOULDER



INTAKE SIGN

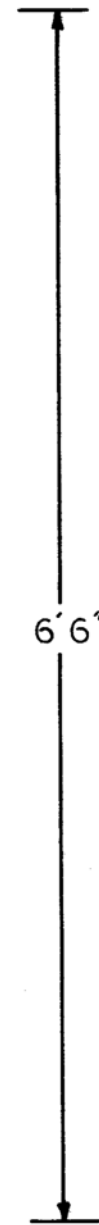
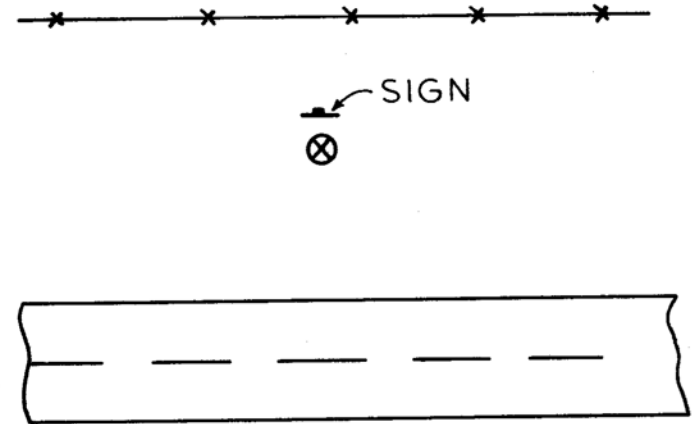
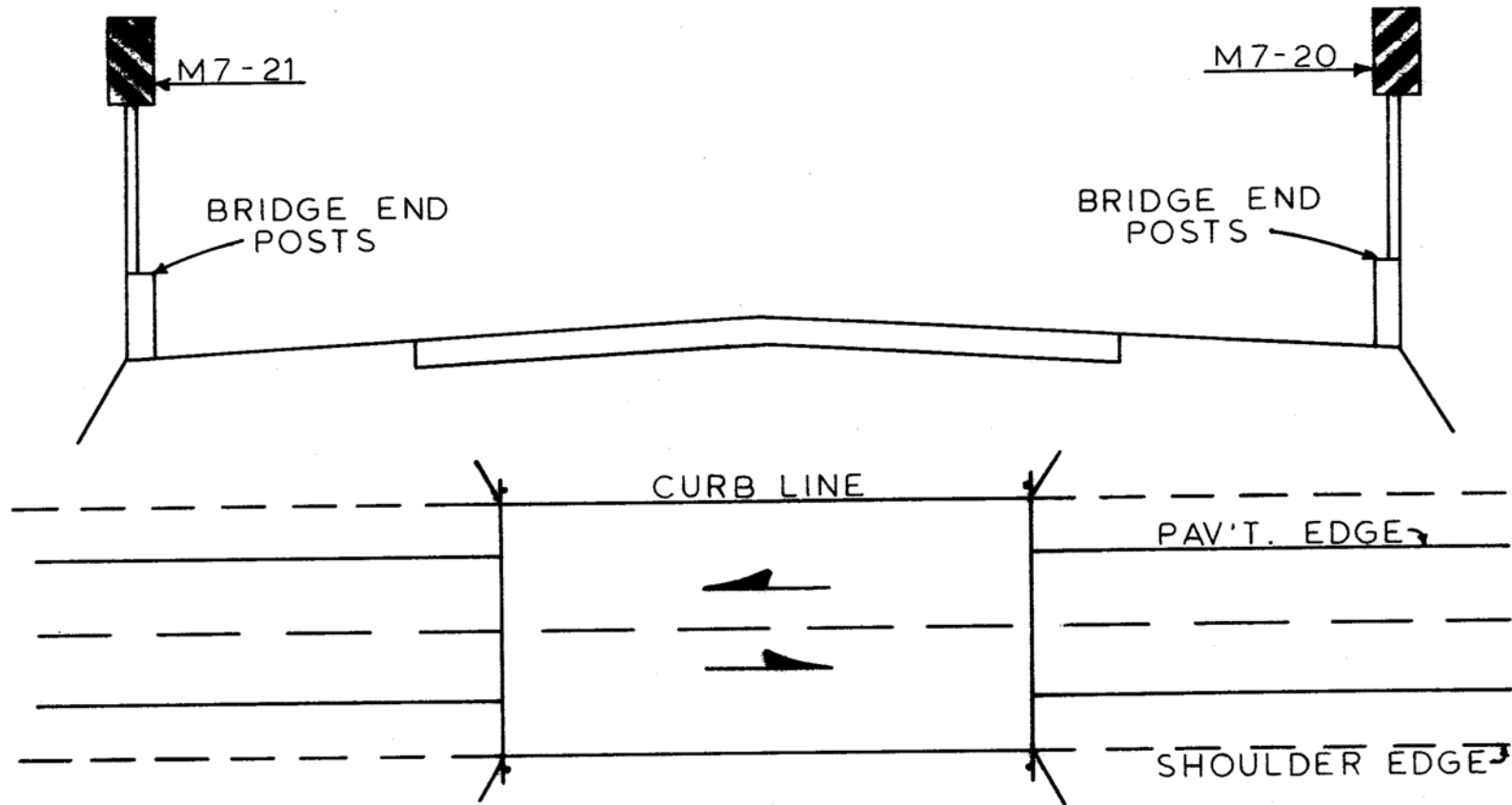


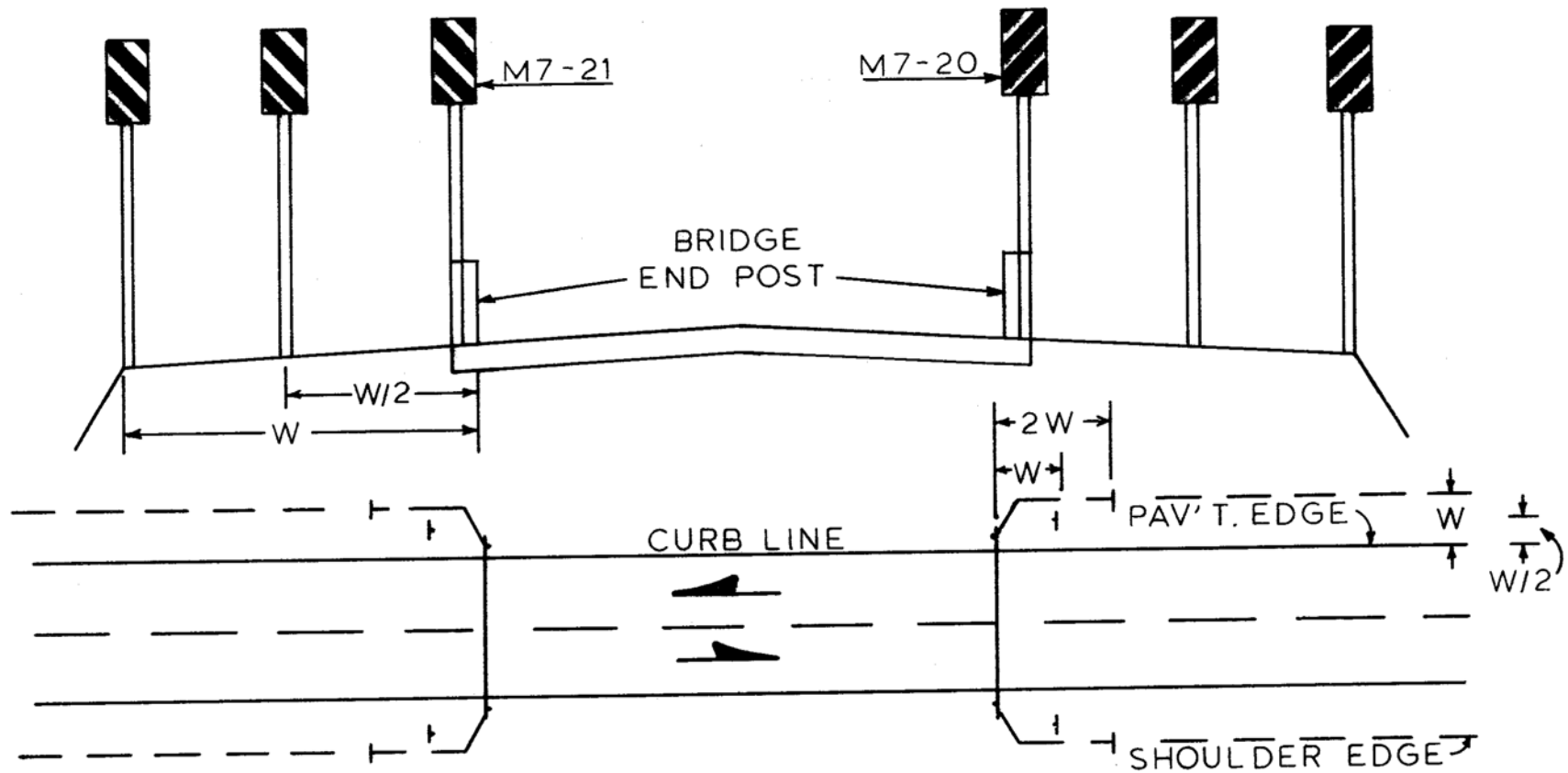
FIGURE 3
6 of 10



LOCATION OF
INTAKE SIGN

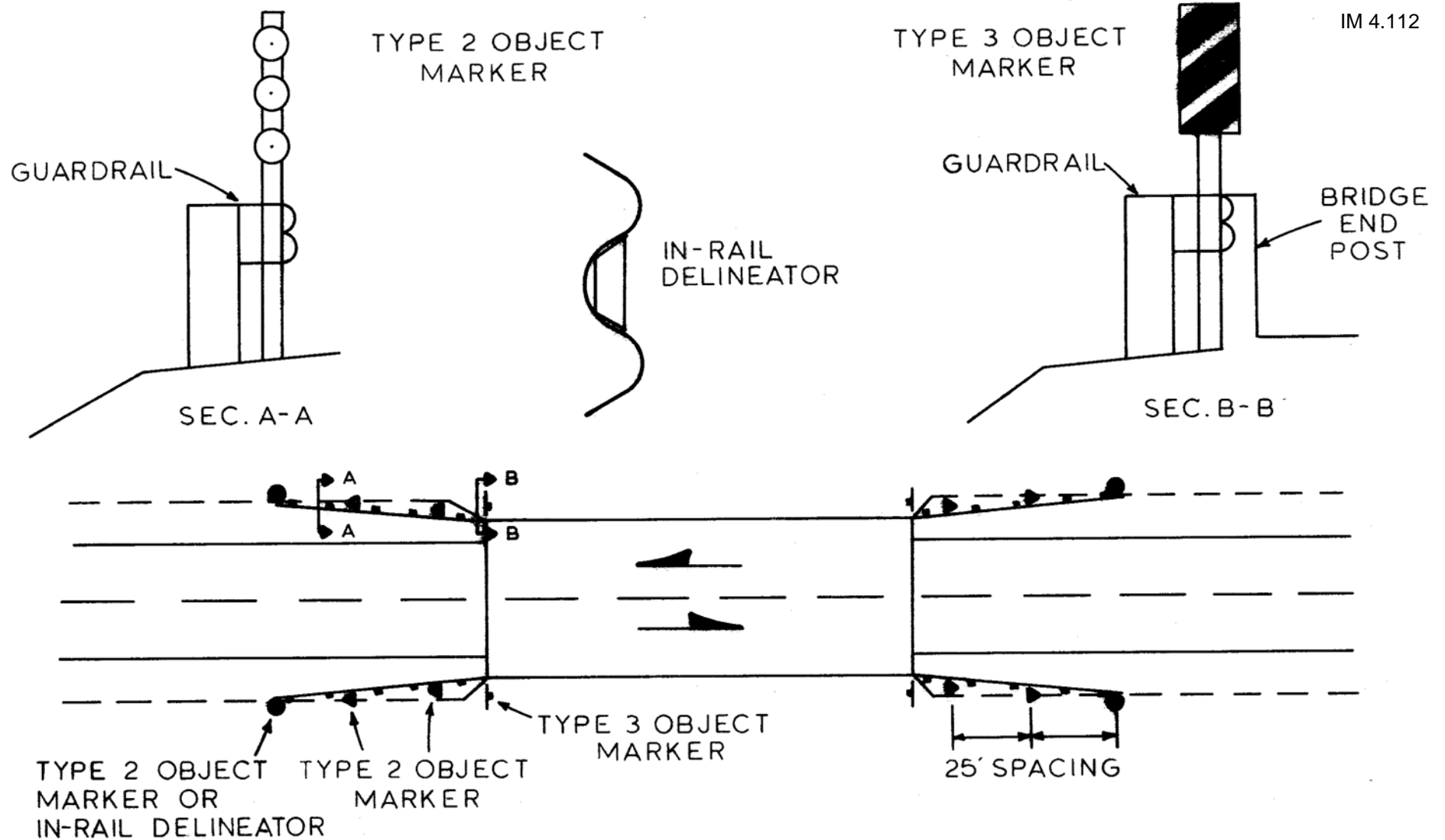


OBJECT MARKER PLACEMENT AT FULL
SHOULDER WIDTH BRIDGES

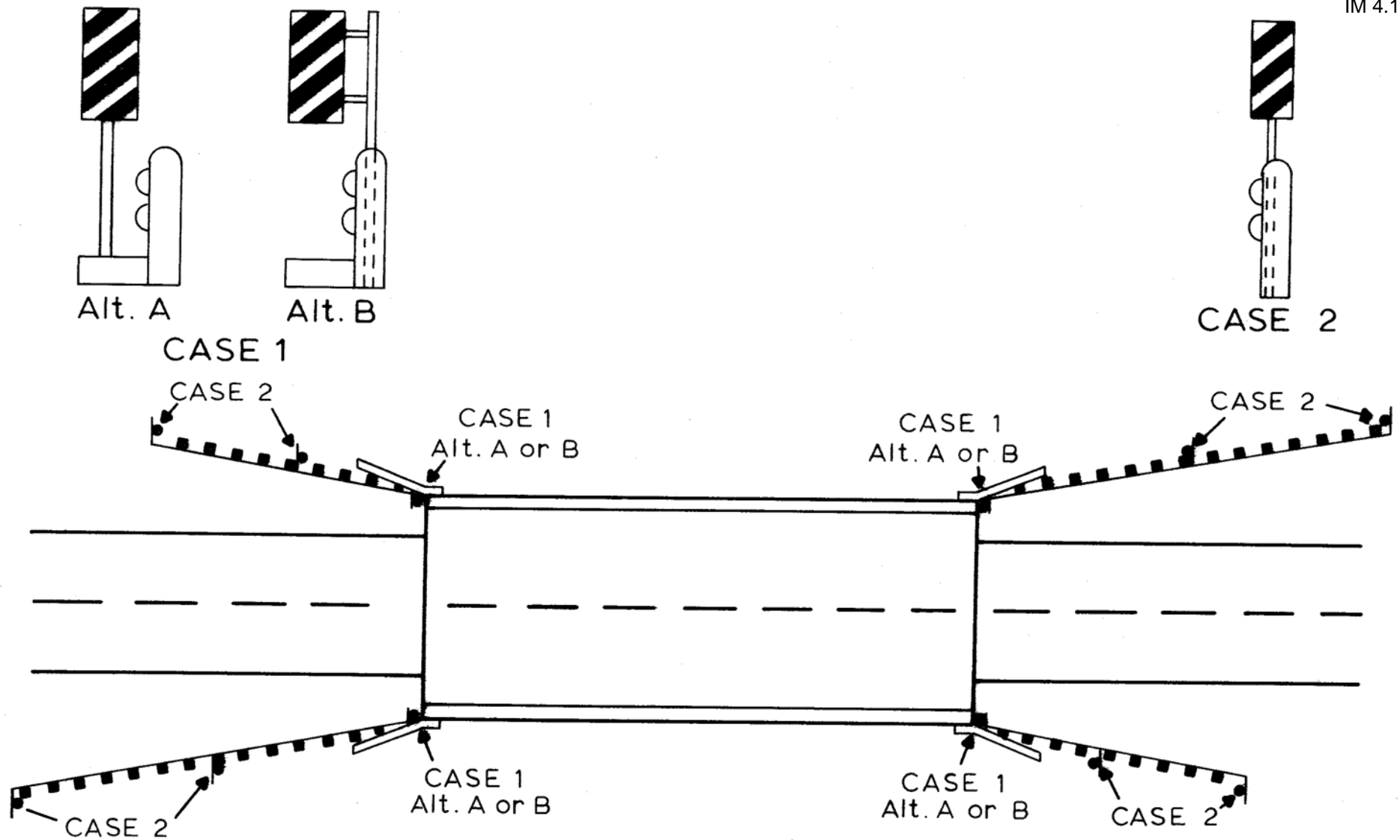


OBJECT MARKER PLACEMENT AT BRIDGES
LESS THAN FULL SHOULDER WIDTH
(NO APPROACH GUARDRAIL PRESENT)

W = WIDTH - CURB LINE TO SHOULDER LINE



OBJECT MARKER PLACEMENT AT BRIDGES
LESS THAN FULL SHOULDER WIDTH
(WITH APPROACH GUARDRAIL ATTACHED TO BRIDGE END)



OBJECT MARKER PLACEMENT AT BRIDGES
LESS THAN FULL SHOULDER WIDTH
(WITH APPROACH GUARDRAIL NOT ATTACHED TO BRIDGE END)